

Chapter 12: Drug Use While Breastfeeding

The following information is intended to be used only to increase the breastfeeding counselor's knowledge on the use of medications while breastfeeding. It is very important to refer breastfeeding mothers to their physician or pharmacist when they have specific questions regarding any medication.

Published information on the subject of drug excretion in breastmilk has long failed to meet the needs of the breastfeeding woman and her caregivers. The problem has been the lack of information on how drugs pass through to breastmilk and consistency in interpreting the information which is available.

Some drugs have been considered contraindicated simply because they are known to be present in breastmilk. Others have been mistakenly classified as “not found in breastmilk.” It is fair to say that all drugs penetrate into breastmilk to some degree. With newer techniques that are capable of detecting microscopic amounts of drugs in milk, it may be of clinical significance for the nursing infant, especially the neonate, who has a limited capacity to detoxify and eliminate drugs.

A conservative approach is appropriate. should first be determined whether a particular drug is absolutely necessary for treatment of the mother at the time can an alternative drug be substituted or treatment can be delayed until the baby is more mature. can the route of administration and the minimal dose necessary for satisfactory treatment of the disorder be considered. If, after investigation, it is determined that the mother requires the drug immediately, nursing should be continued only when information or experience indicates that the exposure is likely to be safe.

When reviewing a drug's possible affect while breastfeeding, it important to determine whether the drug affects the actual production of breastmilk or enters into breastmilk and then affects the infant. Not many drugs affect the production of breastmilk. However, certain classes of drugs can alter the distribution and transfer of blood around the breast region, which changes blood flow to the breast. When this happens, breastmilk production is dynamically changed.

The alveolus is the most important component of the breast when looking at drug transfer. The alveoli cells which make up the alveolus are like tiny factories under the supervision of prolactin. Prolactin stimulates these cells to secrete immunoglobulins, proteins, and carbohydrates such as lactose and triglycerides. Surrounding the alveolus are the myoepithelial cells - smooth muscle cells that respond to oxytocin by contracting and thus squeezing the milk out of the alveolus.

Peri-alveolar (around the alveoli) arteries bring blood to the breast region. Some drugs, such as anti-hypertensive beta blockers, significantly reduce blood pressure and blood flow to this region and can sometimes reduce the production of breastmilk. Diuretics can actually reduce the amount of fluid within the blood, resulting in reduced blood flow to the breast. Humoral factors, such as stress, can also reduce blood flow to the breast and have dynamic effects upon the production of breastmilk.

Drug Transfer into Breastmilk

Several factors play a role in determining the quantity of a drug that will transfer into breastmilk. In the mother, these include her compliance, bioavailability of the drug in the mother, the dosage and frequency of the drug, and route of administration. After she ingests the drug, its absorption, distribution, metabolism and excretion will play a role in the determination of drug levels in her milk. For the infant, the amount and frequency of feedings, flow and pH of the blood to the breast, the composition and pH of the milk, the rate of milk production, and resorption of the drug from the milk back into the mother's circulation are factors affecting the amount of drug that reaches the infant.

A drug can pass through to breastmilk by only three main ways. One is by transcellular diffusion, where the drug crosses the capillary walls into the alveolus. To do this a drug must have a very small molecular weight (e.g., ethanol, methanol, or other solvents). These drugs are so small, that they can "squeeze" through the cell walls.

A second way a drug can pass through to breastmilk is by intercellular diffusion, or transfer in-between the cells. This occurs during the colostrum phase of breastmilk production, when alveolar cells are spaced widely apart. This allows the large immunoglobulins in the mother's circulation to flow between the cell gaps into her breastmilk. This generally occurs for about the first week. After that, the alveolar cells start to grow closer together, reducing the level of intracellular diffusion. It's nature's way of protecting the infant from receiving harmful substances that are ingested by the mother.

The third and most common way drugs can pass through to breastmilk is by passive diffusion (particles pass from an area of greater concentration to an area of lesser concentration until both areas are equal). Very small particles such as iodine, sodium, lithium, and potassium, pass through the mother's plasma and go directly into her breastmilk.

It is important to remember that drugs not only go into breastmilk, but they also come back out as well. There is a normal equilibrium within the body; all tissues are in equilibrium with the plasma (blood) compartment. If a drug gets in the plasma compartment, it will eventually go into another regional compartment within the body, where it may or may not bind. If it does not bind, it will move back out of that compartment. An example of this is alcohol. It is known that alcohol will go into human breastmilk and within an hour or so it will come back out again. Over a period of time alcohol will go into the milk and will come back out as the level in the plasma compartment starts to drop.

Factors Influencing Drug Transfer

► Lipid Solubility

Drugs that are lipid soluble enter breastmilk fairly easily, because breastmilk contains fat. Milk fat can concentrate lipid-soluble drugs, causing the total amount of drug in breastmilk to increase. For highly lipid-soluble drugs such as diazepam (sedative) and chlorpromazine (tranquilizer), well over half of the total amount of the drug in breastmilk is found in the fat. However, because the amount of milk fat is low compared to the total milk volume, the total

amount of drug reaching the infant is usually relatively small. Nevertheless, it is still important to consider lipid solubility when evaluating drug excretion into breastmilk.

► Protein Binding

Protein binding is known for all drugs. Both plasma and milk contain proteins that can bind drugs, although drugs bind more readily to plasma proteins than to milk proteins. Albumin is the main protein that binds to drugs in the maternal circulation; in milk the major drug-binding protein is casein. Only drugs that are free or unbound transfer into tissue sites. The net result effect of protein binding is that highly protein-bound drugs tend to remain in the plasma and to pass into the milk in low concentration.

Drugs that have a low protein binding capacity have a higher probability of entering breastmilk. For example, if a drug has a low binding capacity of 40%, then about 60% of the drug is soluble in the plasma compartment and can pass into breastmilk. If given a choice, a drug should be chosen that is the most highly protein bound within the maternal circulation. For example, sodium warfarin does not cause a problem in coagulation in infants because, it is 99.9% bound to plasma protein. It can't pass through to breastmilk very well.

► Half-Life

The half-life of the drug can give information on when a woman can start breastfeeding again without exposing her infant to that drug. Half-life is also important when looking at the potential for a drug to enter into breastmilk. For the most part as the peak level of the drug rises in the blood, the level of the drug rises in the breastmilk. Then, after the level in the blood starts to drop, the amount that goes into breastmilk is reduced.

The short half-life drugs are easy to use when breastfeeding. If a woman is taking a drug that has a one-hour half-life, she should wait two or three hours, if possible, before breastfeeding, and then there will be very little drug left in her blood or breastmilk, in most cases.

Drugs that have long half-lives are of concern, because these drugs stay in the blood for a long time and therefore in breastmilk. These pose a problem with breastfeeding. For example, Prozac has a 24 to 216 hour half-life so there's no way a mother can breastfeed around it. All during that half-life, all during that exposure, that drug is being pushed into the milk supply. If a mother is provided with a choice, she should choose drugs with shorter half-lives. The pediatric half life of a drug is also important as those with long half-lives are known to continually build up in the infant's blood over time.

If the mother has to use a drug with a long half-life, look at what the studies show as far as other parameters--such as lipid solubility, and protein binding. If there is a choice between two long half-life drugs, choose the one that has more protein binding ability.

► Molecular Size

The ability of a drug to enter breastmilk depends, to a degree, on the size or molecular weight of the drug. The lower the molecular weight (200 or less), the more readily it will enter breastmilk. This is not to be construed to mean that as molecular weight of a drug increases, the less likely

the drug will pass through to the milk. Other factors are involved such as protein binding and lipid solubility which have been mentioned previously.

► Other Factors

The previous discussion relates to constant, steady-state conditions in which the drug concentrations in the milk and the blood are in equilibrium. Because constant blood concentrations are the exception rather than the rule during drug therapy, other factors must be taken into account during intermittent drug use.

A drug that enters the milk rapidly will achieve a greater initial concentration in milk relative to the concentration in the blood than a drug that enters milk slowly. Because milk is produced and periodically emptied through breastfeeding, drugs that slowly reach equilibrium (in the blood and milk) may never achieve high concentrations in milk. Another factor for some drugs that may affect the rate of passage into the milk is the rate of blood flow to the breasts.

Retrograde diffusion (drug passing from the milk back into the mother's blood) is another factor that comes into play during intermittent drug use. This brings up the issue of "pumping and dumping" breastmilk. Mothers have often been advised to pump their milk and discard it to hasten the disappearance of some drug from breastmilk. This advice is based on the misconception that once a drug has passed into the milk, it will remain there until the breasts are emptied. However, because of retrograde diffusion, this is not the case. In addition, diffusion (movement of molecules in fluid towards an uniform distribution throughout the fluid) into milk is a minor route of drug elimination (usually less than 1% of the mother's dose).

► Infant Factors

Infant factors can be important in determining the safety of using a particular drug in a breastfeeding mother because infants do not absorb and eliminate drugs in the same way as adults. Factors that can influence drug absorption are the infant's higher gastric pH, gastrointestinal (GI) flora and GI transit time, and reduced amounts of bile salts and pancreatic enzymes. The affinity (attraction) of newborn's plasma proteins for drugs is also less than in older infants, which leads to increased free drug concentrations in the blood. Both hepatic metabolism and renal excretion of drugs are low in newborns also.

All the above factors can lead to prolonged drug half-lives in neonates (first 28 days of life) which may allow drugs to accumulate to unexpectedly high concentrations with repeated dosing. This effect may be magnified in preterm infants, whose metabolic and renal excretory capacities are less than those of full-term neonates.

In addition, responses to medications are sometimes different in infants than they are in older children and adults. These differences may be because of immature enzyme systems, differences in the number or affinity of drug receptors (a protein molecule on the cell surface that binds the drug to the cell), immaturity of the nervous system, and increased permeability (access) of some membranes such as the blood-brain barrier to the drug.

Methods of Estimating Infant Drug Exposure

► Milk:Plasma Ratio

The milk-to-plasma ratio (M/P ratio) is the ratio of the concentration of a substance in milk to the concentration of the substance in the plasma. It has often been used as an index for the amount of drug that will pass into breastmilk. However, because of the variances between the concentrations of drugs in the blood and milk, it can only be used as an *indicator* of whether or not drugs will go into the milk. (Milk:plasma ratio depends on when the milk sample was drawn and when the blood sample was drawn.) Another factor to consider, also, is the higher the ratio, the higher the *probability* that the drug is going to enter into breast milk,. Drugs that have a milk:plasma ratio of about one, like ethanol, or alcohol, have a drug concentration in breastmilk that is equal to that of the plasma level itself. An equilibrium (balance) is maintained between the plasma compartment and the mother's breastmilk.

Milk:plasma ratios should only be used to determine whether or not drugs get into breastmilk.

► Percentage of Maternal Dose

Like the M/P ratio, the percentage of the maternal dose that an infant receives has been used to summarize clinical data and assess the safety of a drug during breastfeeding. Although it may be somewhat more useful than the M/P ratio, it is best viewed as a method of estimating the dose an infant will receive through breastmilk rather than being used to determine whether or not the drug is safe during breastfeeding. A major reason this method should not be used alone is that it is based on the concept that the way the mother's and infant's systems handle drugs is the same, which is not the case.

► Infant Dosage

The equation to determine infant dosage is:

Infant dosage = drug concentration in milk x volume of milk ingested

An average of 150 ml/kg/day has been estimated to be the daily breastmilk intake by a healthy infant. When this estimate and the average dose-adjusted milk concentration for a drug (approximately the concentration at the midpoint of the dosing interval) are used, the average drug dosage that would be received by the infant can be calculated. This calculation is most useful when the mother is on long-term therapy with a drug that can accumulate.

Other Factors to Consider

The package insert on a drug provides information on the time-to-peak interval, the half-life of the drug (discussed above), the volume of distribution, and how the drug is metabolized.

► Time-to-Peak Interval

The time-to-peak interval varies dramatically depending on the drug's function, the type of tablet ingested- short- or long-term release, and how it's administered - intravenously, orally, or subcutaneously. The most useful parameter to look at is how long it takes for the drug to be absorbed orally. An example would be penicillin with a one-hour time-to-peak interval.

That means that at one hour, the drug will be at its peak in the plasma. This “peak” would be the time when the mother should *not* breastfeed.

It is best to assume the drugs that enter the central nervous system (e.g., diethylpropion used as a diet aid) are likely to penetrate breastmilk to a greater degree. Time-to-peak intervals are useful in attempting to breastfeed around these types of drugs. It is important to look at how long it takes for the drug to reach its maximum levels in the mother’s blood. If it’s short, one or two hours, having the mother withhold breastfeeding for 3 hours or 4 hours will reduce the amount of drug in her breastmilk. (Since most milk is made during the letdown process, only a small portion of the drug is in the foremilk that is retained in the breast.)

► Volume of Distribution

Volume of distribution, means where a drug goes in the body. Drugs can go to various sites or compartments within the body such as the liver, skeletal muscles, breast tissue, adipose tissue, the heart, or the brain. Drugs tend to isolate in various compartments (not necessarily plasma) and can become highly concentrated. Therefore, an article that states, for example, “the plasma level of drug X was undetectable or very low in the nanogram (one billionth of a gram) concentration in the infant,” may be somewhat misleading. Think of the body as one huge compartment of multiple, mini-compartments. Those mini-compartments are filling all the time, like a small river dumping into the ocean. The ocean may be the heart, or skeletal muscle, but the level of concentration to be concerned with is the small little river (like the plasma).

Following are a few examples of how drugs are distributed: the fat soluble vitamins A, D, E, and K like to sequester (isolate) in the liver; all the aminoglycosides sequester in the kidney. Concentrations in the kidney of aminoglycosides are five- to ten times higher than in the plasma compartment. The inner ear mechanism is also very sensitive because high concentrations of aminoglycosides build up there. Digoxin concentrates in the heart. If the plasma level of digoxin was measured in a normal individual, it would be in the nanogram range. However, if the level was measured in the cardiac tissue of an infant, it would be forty-six times higher than in the plasma. Thus reading that there was only one nanogram of drug X in the plasma compartment hasn’t addressed anything about the level in any other tissue sites. One should be cautious of reports that say there are very small levels of a drug in the infant’s plasma. That is only one small part of the story. Information on where the drug is going and what the concentrations are in the remote sites are even more important.

What about the mother who has been taking a medication while pregnant and who wants to breastfeed her infant? When an infant is in-utero, the mother’s body does most of the metabolizing of the drug. The drug passes in and out of the infant through the maternal circulation, resulting in lower levels for most drugs in the infant. Once a mother delivers, the scenario changes. Questions that need to be addressed are listed in Table 1.

What about the metabolism of the drugs used during labor? Some of the drugs are not only sequestered in the infant and can stay in there once delivered, but, can also pass into the breastmilk during the first few hours. Fortunately, most of the drugs used during labor have very short half-lives and are not orally absorbed. Most of the lidocaines and the local anesthetics have a “first pass phenomenon,” which means that 99.9% of the drug is absorbed by the infant’s liver the minute it reaches the gastrointestinal tract (GI).

Questions to Address When Mother Requires Medication
<ul style="list-style-type: none"> • How does the infant handles, processes, and metabolizes the drug? • How much of the drug enters the breastmilk? • Is this a newborn infant? • Is this a premature infant? • Is this infant deathly ill?

Table 1. Questions to Address.

► Oral Absorption

Two questions to consider on a drug's absorption are:

1. Does the infant absorb the drug?
2. Is it likely to be absorbed by the mother, as well?

It is important to remember that a drug has to enter the maternal GI tract first, and then go through her body before it can enter her milk. Each drug can do so at different rates and ratios, but nevertheless, a portion of the drug will eventually get into her milk. In most cases, the drug then goes into the infant's GI tract. If the drug is not absorbed orally, there is less concern about it being absorbed in the infant and causing systemic problems. The question then becomes, does the drug cause GI problems in the infant? For example, magnesium sulfate (laxative/anticonvulsant) given intravenously to the mother, goes into her milk. Once it gets into her infant's GI tract, eighty-five percent stays there. It acts as a laxative, but most of it does not enter the infant's systemic circulation. Other drugs are very inactive in the GI tract, even in an infant, and some drugs are so susceptible to the acid environment of the infant's stomach, that they're destroyed.

If the drug can be absorbed orally, then the questions to ask are:

1. Is the dose high enough to cause a problem in the infant?
2. Is the dose going to be sustained long enough that it causes a problem.

High concentrations of any drug should be avoided. Be concerned about mothers who are taking extraordinarily high doses of a drug and want to breastfeed. Drugs enter breastmilk as a function of dose. If a mother is taking massive doses of a drug, then more may be going into her breastmilk. For example, a study in which mothers used a one hundred milligram tablet of a drug reported that only a microgram of the drug entered the breastmilk. This sounds fairly safe. However, if the woman is using five or six hundred milligrams, it's a whole different story. *The higher the dose, the higher the concentration in breastmilk.*

Selected Types of Medications

► Contraceptives

Combined oral contraceptives (OCs) containing estrogen and progestin can significantly reduce milk output and are not recommended while breastfeeding. Progestin-only OCs, Norplant (levonorgestrel) or Depo-Provera have minimal or no effect on breastmilk and are preferred because of their lack of detrimental effects on breastfeeding. Although progestin-only OCs may be started in the first week postpartum, it is recommended that they be started *after* lactation has been well established and be given in the lowest effective dose (at least six weeks). Depo-Provera can be started in the first week postpartum, but it is preferred that it be delayed until six weeks postpartum. Norplant is ideally started after 30 days.

► High Doses Steroids

On short term therapy, high dose steroids don't cause much of a problem. They are transferred to infants somewhat, and can cause some sodium retention in the infant. However, if used over prolonged periods of time, like weeks or months, it's conceivable that they could cause esophageal rupture or gastroesophageal ulcerations. It's also possible that if the infant absorbs enough, the growth rates of epiphyseal bone plates (growing plates in their bones) can be slowed down or the plates can close, stunting a child's growth over prolonged periods. For the most part, however, short-term use of steroids is compatible with breastfeeding.

► Antibiotics

The risks vary among the groups of antibiotics. Most antibiotics are relatively safe for the breastfeeding mother. A general rule of thumb is that if the antibiotic can be given to the infant directly, it can also be taken by the breastfeeding mother. As would be true for the mother, the infant should also be monitored for possible drug hypersensitivity. Because any oral antibiotic can change the GI flora and mucosa, the infant's stools may loosen and change in color. Penicillins are not usually toxic, but theoretically can cause sensitivity in the infant. Sulfa drugs should not be used in the first month of life because they can interfere with the binding of bilirubin to protein. Chloramphenicol is not recommended for use in very young infants because of the risk of accumulation of the drug. Tetracycline may cause staining of teeth when therapy exceeds 10 days. Metronidazole (Flagyl) appears in breastmilk and is dose- and time-related. An alternative treatment regime is to give a single 2 gm. dose, and interrupt breastfeeding for the next 12 to 24 hours. An alternative therapy should be recommended.

Clindamycin vaginal is a product available for the treatment of trichomoniasis. Only a very small amount of it is absorbed by the mother and only about 5% of the dose can be orally absorbed through breastmilk. Another vaginal product, metronidazole vaginal gel, called metro gel, produces only 2% of the mean peak serum level of the 500 milligram oral tablet. It is also a good medication for trichomoniasis in breastfeeding mothers because it isn't absorbed.

► Analgesics

Narcotics such as codeine, propoxyphene (Darvon), and meperidine (Demerol) appear in breastmilk at low levels. Individual variation is common. Young infants can experience drowsiness, poor breastfeeding and weight loss when their mothers take this type of medication. Care should be taken to monitor the infant carefully. As with most drugs, it is advisable to use only those analgesics that have the most information available regarding their safety during lactation.

► Asthma Medications

Asthma medications, specifically the beta-2 agonists, have a small molecular weight. They do enter breastmilk and can cause tremors, anxiety, and nervousness in infants. They shouldn't be used for prolonged periods by the mother.

► Radioactive Compounds

Although the usual practice is to avoid the administration of radioactive drugs to breastfeeding mothers, not all radioactive compounds require interruption of breastfeeding and some require less than 24 hours. The ideal situation is to obtain a series of milk samples from the mother to determine, *on an individual basis*, how long breastfeeding should be interrupted. During any time the mother does not breastfeed, she should be instructed to continue to express and discard her milk. Recommend a lactation consultant for help and advice on this issue. A radiologist/radiopharmacist is also knowledgeable about the effects of individual agents and is a good resource contact.

When using radionuclides, or radioactive compounds, like I-125, I-131, or Gallium, the general rule is that the mother should wait five half-lives before breastfeeding, because after five half-lives, 97.5% of the radioactive compound is gone. That poses a problem with I-125 because it has a sixty-day half-life. Most physicians are very hesitant to use iodinated products and continue breastfeeding. Iodine has an enormous affinity for the thyroid of a newborn or a young infant. If using radioactive, I-125 or I-131, the mother should seriously consider discontinuing breastfeeding. (In situations where breastfeeding is stopped either temporarily or permanently, the advice and help of a breastfeeding counselor can be of much aid and comfort in getting the mother and infant successfully through the weaning process.)

► Nicotine Patches

Nicotine patches are in prolonged-release forms. The patient must leave them on for 18 to 24 hours. Most people don't like to leave them on more than 18 hours because they can cause hallucinations. The package insert provides no information on how nicotine, in this form, penetrates into breastmilk. The nicotine milk:plasma ratio is fairly high, about 2.9 - 3. The adult half-life, is about 2 hours of nicotine, if injected. The patch half-life is about 24 hours because it's in a sustained, steady form. No information is available on infant half-life. Nicotine is a very potent drug. It has been documented that the nicotine blood level in people who smoke about 1 to 2 packs a day, approaches 44 nanograms per mil. Nicotine blood levels in patch users is about 1/3 that, about 17 nanograms. If a patient is going to stay off of smoking and stay on patches, they're probably going to have a more or less sustained level of 17 nanograms.

This level is going to be about 1/3 or less than what it would be if they were smoking one or two packs a day. So, it's *probably* safe for a breastfeeding mother to use these. What is critical though, is that the dose can go up 2 or 3 times if the mother uses both the patch and smokes. It could be very dangerous for a breastfeeding infant if the mother starts smoking again and continues to use the patch.

► **Antifungals**

The topical drugs nystatin and miconazole are used for thrush. Nystatin is poorly absorbed, while less than 50% of miconazole is absorbed. A new antifungal to consider is diflucan (Fluconazole). It can be given to the mother and baby.

► **Anti-Depressants**

Anti-depressants such as Prozac, have very few side effects. The problems are that it has an extensively long half-life, it penetrates breastmilk quite avidly, it's well absorbed by the infant, and it could conceivably build up slightly in an infant. Since an infant's brain will double in size in his first year of life, caution needs to be taken when considering this drug.

► **Sedatives**

Diazepam (Valium) should be avoided by breastfeeding mothers as it passes quite avidly into breastmilk. Whether they produce any side effects in infants is a matter of great controversy in the literature.

► **Antimetabolites**

Anti-cancer drugs are too dangerous to use in breastfeeding infants and should be avoided at all times.

► **Cardiac Drugs**

Digoxin is considered safe while breastfeeding as long as the mother's serum levels are carefully monitored. Varapamil should be avoided during the neonatal period.

► **Antihypertensives**

If beta blockers are used, the drug of choice would be propranolol. Any time a breastfeeding mother is taking a beta blocker, the infant should be monitored closely.

► **“Street Drugs”**

A woman who is currently using any of the “street drugs” like hallucinogens, cocaine or phencyclidine (PCP) needs to be advised to avoid breastfeeding.

Over-The-Counter Medications

Although over-the-counter (OTC) medications are generally considered safe to use, that

is not true in all cases. The possibility that an OTC drug found in breastmilk might harm the infant must be considered. The decision to breastfeed or not, while taking an OTC drug, should be based on the mother's personal desires and on available objective information.

In many cases OTC drugs are a combination of several drugs. Even if the ingredients are in small quantities, in most cases they will pass into breastmilk the same way prescription drugs will. The breastfeeding mother may not be aware that OTC medications can pass through to her breastmilk and into her infant. In addition, she may not follow the package directions, may take an inappropriate medication, or follow incorrect advice given by a family member or friend. It is very important that a health professional inform the breastfeeding mother to follow directions appropriately and refer her to a physician or pharmacist when she has specific questions regarding *any* medication.

NOTE: A list of OTC drugs is included at the end of this chapter. The list has been reprinted with permission of Frank J. Nice, DPA, CPHP from the National Institutes of Health.

Over-The-Counter Drug Categories

► Topical Nipple Creams

Most of the topical creams used on the nipple are absorbed. Any vitamins, such as Vitamin E, or any substances applied directly to the nipples will be absorbed by the infant. Topical products must be used very cautiously and at infrequent intervals. High doses should be avoided.

► Analgesics

Most analgesics (e.g., acetaminophen, ibuprofen), when taken in the recommended doses and used occasionally or for acute conditions, rarely cause adverse effects in the nursing infant. Acetaminophen is often the drug of choice for the breastfeeding mother, especially during the neonatal period. Ibuprofen appears to be a safe choice, too, because of the very low levels found in breastmilk (when the mother ingests 400 mg or less per dose). Aspirin, if taken chronically by the mother, may decrease the infant's prothrombin (blood-clotting) level. Additionally, because of the possibility of the infant developing Reye's syndrome, the use of a safe analgesic should be considered. Other analgesics such as salicylamide (BC Powder) and magnesium salicylate (Doan's Extra Strength) should also be avoided.

► Antacids/Digestive Aids

Nonsystemic (doesn't go throughout the system) antacids containing aluminum, calcium or magnesium carbonate, aluminum or magnesium hydroxide, magnesium trisilicate, magaldrate, or bismuth subsalicylate are not easily absorbed by the infant and are considered appropriate for use by the breastfeeding mother. Systemic (goes throughout system) antacids, such as sodium and/or potassium bicarbonate or sodium tartrate-citrate, should be avoided. Antiflatulent agents (simethicone), digestive aids (Lact-Aid), and lactobacillus acidophilus products are considered safe for use by the mother.

► Antidiarrheal Preparations

Kaolin-pectin, attapulgit, or bismuth subsalicylate preparations are recommended because they are poorly absorbed.

► Asthma Preparations

Inhalers which contain epinephrine or racemic epinephrine, and oral preparations containing ephedrine, guaifenesin, theophylline and/or phenobarbital in various combinations, are available as OTC products. The breastfeeding mother should consult her doctor before using any OTC asthma preparation to ensure adequate and proper treatment of her condition.

► Cough, Cold, and Allergy Preparations

These types of products can contain up to eight different antihistamines, eight different decongestants, a cough suppressant (dextromethorphan), an expectorant (guaifenesin), and three analgesics (acetaminophen, aspirin, or ibuprofen). Other ingredients may also be added, such as alcohol, local anesthetics, “soothing” agents, antiseptics, and even herbal extracts. Individual products may contain up to five or more active ingredients. Many of these products may cause drowsiness in the breastfeeding infant or possibly decrease milk production in the mother which necessitates her drinking extra fluids.

Single-ingredient, short-acting antihistamine preparations containing brompheniramine, chlorpheniramine, diphenhydramine, and triprolidine are considered safe to take while breastfeeding if the infant is monitored for drowsiness. Similarly, the single (active) ingredient decongestants phenylephrine, phenylpropanolamine, and ephedrine can be safely taken alone or in combination with the antihistamines mentioned above, provided the mother monitors her milk supply. If the mother notices a decrease in her milk supply, she should temporarily discontinue the decongestants to rebuild her supply.

Dextromethorphan and guaifenesin as single (active) ingredients or in combination with each other can be used for alleviating cough symptoms. Some analgesics in combination with cough, cold, and/or allergy preparations are not recommended for breastfeeding mothers, (Please refer to section on analgesics for those considered safe to use while breastfeeding.)

OTC preparations containing 20% to 25% alcohol should be avoided. Soothing agents such as camphor, eucalyptol, and menthol; local anesthetics such as benzocaine and dyclonine; and the antiseptic cetylpyridinium, used in small quantities in cold lozenges, appear to be safe for use by breastfeeding mothers.

► Laxatives

When a breastfeeding mother needs a laxative, a bran or bulk-forming product would be preferred, such as psyllium or barley malt. Senna laxatives appear to be safe for use, but should not be the first choice. Other stimulant laxatives which includes bisacodyl, cascara sagrada, and phenolphthalein are best avoided because they have been found in breastmilk.

Stool softeners (e.g., ducosate) are apparently safe and seem to have no effect on the breastfeeding infant. The breastfeeding mother should be advised to maintain an adequate fluid intake when she takes a stool softener. Other laxatives such as castor oil and magnesium citrate should not be used.

► Nasal Decongestants

The safety of nasal decongestants for breastfeeding mothers has not been established. It may be more prudent for the mother to try an isotonic sodium chloride nasal preparation (e.g., Ocean, NaSal) or use a cool-mist vaporizer.

► Nausea and Vomiting/Motion Sickness Preparations

Diphenhydramine or dimenhydrinate are appropriate for use in the prevention of motion sickness; however, the baby should be monitored for signs of drowsiness. The mother should be advised to breastfeed just before taking her medication, when possible. Products made with cyclizine and meclizine are not recommended because of lack of information on their safety of use while breastfeeding.

► Sleep Preparations

Since most OTC sleep preparations contain diphenhydramine as their active ingredient, the same recommendations should be given and the same cautions observed as were previously discussed for antihistamine use. The mother should be encouraged to try other means to induce sleep (e.g., relaxation techniques, a glass of warm milk) instead of using this type of medication. If the mother absolutely requires a sleep aid, she should breastfeed just before taking her nighttime dose.

► Stimulants

The ingestion of less than 150 mg. of caffeine two to three times a day has no apparent effect on a breastfeeding infant. (A cup of coffee made in an automatic drip coffee maker has approximately 137 mg. of caffeine per 6 ounces.) If the mother drinks coffee, tea, or cola, she may drink a cup (6 oz.) of one of these beverages rather than take the OTC drug. If the mother is taking theophylline for asthma, she should avoid caffeine in all forms.

► Weight Control Products

The most common OTC weight control products contain phenylpropanolamine in doses of 25 to 75 mgs. as either immediate-release, or long-acting. There is no data available on the effect of chronic use of phenylpropanolamine on the breastfeeding infant. Taking this type of medication is not the best way to lose weight. The mother should be referred to the dietitian or nutritionist for counseling on how to lose weight safely and effectively.

► Nicotine

Nicotine enters the breastmilk through the mother's blood. Although the effects of cigarette smoking while breastfeeding do not appear to be as hazardous as when pregnant, heavy smokers may have a decreased milk supply, lower prolactin levels, and a lower vitamin C content in their breastmilk. Smoking may also interfere with the milk-ejection reflex. Infants of smokers are more likely to experience nausea, vomiting, cramping, colic, and diarrhea than those of non-smoking breastfeeding mothers. In the situation where the mother smokes very little, the amount of nicotine the infant receives from the environment would probably be more significant than that from breastmilk.

To reduce the potential harm from smoking all mothers should be encouraged to:

- Quit- if at all possible.
- Reduce cigarette intake to a minimum.
- Smoke outside the house and car or any other confined space that the infant shares.
- Breastfeed exclusively for the first 6 months to maximize the infant's protection against respiratory disease.
- Continue to breastfeed for as long as possible.
- Smoke only after breastfeeding.
- Ensure that others do not smoke around the infant.
- Do not take an infant into a smoky environment.
- Increase the consumption of vitamin C-containing foods.

► Herbal Remedies/Herbal Teas

There has been an increase in the use of herbs and herbal teas, especially among those interested in natural foods. Many people believe that "herbal" remedies are "natural" and "safe." This is not always the case. Many of the drugs used today originally came from herbs. If a mother is consuming an excessive amount of any herbal product, its contents should be checked. The health professional should contact the nearest poison control center for help on identifying potentially hazardous products.

Much of the interest in herbal teas has evolved as individuals seek a beverage that does not contain caffeine. What they get, sometimes, is another compound instead, often one more potent and much of the time one about which considerably less is known.

Like drugs, herbs can produce side effects. Some herbs act as stimulants, others as tranquilizers. Certain herbs can also affect breastfeeding. Sage, if taken in large amounts, is reported to reduce a mother's milk supply. Licorice can increase blood pressure.

Major brands of herbal teas are considered safe for the breastfeeding women. However, caution should be taken with the "private brands" or herbs brewed as tea.

Herbal teas are available that are prepared carefully, using herbs only for essence and avoiding heavy doses of herbs with active principles. The strength of any tea depends on how it is made, however. An ordinary tea bag with hot water run over it will contain little active

ingredients. However, when it is steeped for 5 minutes the potency is increased tenfold. Some teas are harmless, even beneficial, such as rose hips tea, which contains a large amount of vitamin C. Other teas are made from plants known to be poisonous.

If a mother drinks herbal teas, ask her how many cups she drinks per day. A mother who drinks a few cups of herbal tea a day is unlikely to encounter any difficulties. But if the mother is regularly drinking a quart or more a day, and the tea contains active or potent ingredients, it may produce unexpected reactions in the mother or her breastfeeding baby.

A galactagogue or “Mother’s Milk” is a blend of herbs that for many generations people have believed will increase a mother’s milk supply. The mix of herbs in this tea - fennel seeds, coriander seeds, chamomile flowers, lemongrass, borage leaves, blessed thistle leaves, star anise, comfrey leaves, and fenugreek seeds - is free of caffeine, but taken in excess, it can have its own possible side effects, including vomiting, vertigo, insomnia, and restlessness. As with all food and drink, it should be taken in moderation.

If the mother is concerned about her milk supply, talk with her about other, more effective ways she can increase it. Herbs to avoid while breastfeeding are included in Table 2.

Herbs to Avoid While Breastfeeding*
<ul style="list-style-type: none">• basil• coltsfoot leaf• indian snakeroot• kava/kava root• petasite root• senna

Table 2. Herbs to Avoid.

*information obtained from: Mark Blumenthal. American Botanical Council: Austin, TX.

Some commonly used herbal teas and other herbal remedies are toxic to the liver. An example is comfrey tea, the effects of which are cumulative. Cases of liver damage from comfrey ingestion have been cited in the U.S., the United Kingdom, and New Zealand. Coltsfoot is also toxic. Pokerooroot, which has in the past been recommended for use with cracked nipples is also highly toxic, to the point where gloves are advised to be worn when handling it.

In 1994, a letter by Rosti (*Acta paediatrica*, 1994, 83:683) reported two cases of newborns with toxic effects from maternal ingestion of an herbal tea taken in the belief that it would “stimulate lactation.” The teas contained extracts of liquorice, fennel, anise, and galega officinalis. The infants presented with hypotonia, lethargy, emesis, weak cry and poor suck. The teas were stopped and breastfeeding withheld for two days. When breastfeeding was resumed, no further symptoms were noted.

► Caffeine

Although caffeine is transported at very low levels from the mother's blood into the breastmilk, it can accumulate in the infant over time. Moderate intake of caffeine (<6-8 cups/day) causes no problems for most breastfeeding mothers and their infants, although some mothers and babies may be more sensitive than others. Excessive caffeine consumption may make the baby fussy and wakeful. When figuring caffeine intake, all sources the mother is consuming should be counted - coffee, tea, soft drinks containing caffeine, over-the-counter cold medicines, etc.

A baby who is being over stimulated by caffeine is wide-eyed, active, and alert and does not sleep for long. He may also be unusually fussy. To find out if these symptoms are caused by excess caffeine, suggest the mother try going without caffeine for 2-3 weeks, substituting caffeine-free beverages for those containing caffeine. If the baby is being over-stimulated by caffeine, he should begin settling down to a more normal sleeping pattern within a few days to a week after his mother eliminates caffeine from her diet.

► Alcohol

There is no scientific evidence that consumption of alcoholic beverages has a beneficial impact on any aspect of lactation performance. Alcohol is one of the most rapidly absorbed drugs known. After oral ingestion, the peak blood levels are often reached in 15 minutes or less. Peak alcohol levels in breastmilk occur 30-60 minutes after ingestion on an empty stomach and 60 - 90 minutes when taken with food. Some research suggests that the concentration of alcohol in breastmilk will reach levels similar to that in the mother's blood.

Based on this evidence, it is recommended that alcohol intake be limited during lactation. If alcohol is used, advise the mother to limit her intake to no more than 2 oz. of liquor, 8 oz. of table wine, or 2 cans of beer per day. Also recommend that the mother breastfeed her infant prior to drinking alcohol.

Many physicians will recommend that breastfeeding women consume a small amount of alcohol prior to breastfeeding in order to help let-down. Since this is not supported by any research, a better recommendation would be to take a few minutes and relax with a glass of water or juice prior to feeding.

Moderate to heavy alcohol consumption can interfere with the milk-ejection reflex, as well as the mother's ability to care to her infant. Regular, heavy drinking by the breastfeeding woman may result in slow weight gain or failure to thrive in her baby.

The direct effects of alcohol on the breastfeeding infant are determined by many factors including:

- the quantity of alcohol consumed;
- the mother's pattern of drinking;
- the time interval between alcohol ingestion and breastfeeding; and
- the age of the infant.

One recent study found that alcohol consumption by breastfeeding women caused a decrease in

milk intake by their infants and an altered sleeping pattern. Although the dose was small, infants have a limited capacity to oxidize alcohol. The altered sleeping behavior of the infants suggests that the alcohol, even in small quantities, may have had an effect on them.

General Questions to Consider

Many factors need to be taken into account when working with a breastfeeding mother who is or wants to take a medication. Although the medication must be prescribed by a physician, other health professionals can still discuss some options with her. Consider the following questions:

1. What's the age of the infant?
2. Is the infant premature, full term or older?
3. Is the infant cachexic or very sick?
4. Is the mother breastfeeding at one month? at 11 months?
5. Is the drug orally absorbable in the child? Or in the mother?
6. Is it available only in intravenous forms? (If so, then it's probably not going to be absorbed orally.)
7. Does the drug have reported side effects or does it produce side effects?
8. Is the milk:plasma ratio high or is the amount secreted in milk high enough to produce side effects in nursing infants?
9. Is the drug really important to this mother?
10. Could she wait a few weeks? Or could she wait three or four months?
11. Can the mother nurse around the doses?
12. Is the drug active into the central nervous system?
13. What's the half-life of the drug?
14. What's the potency of the drug and the toxicity?
15. What's the duration of action?

When talking with a physician about a medication, it's advisable to know the facts about the drug such as, "the half-life of this drug is 0.9 hours, after two hours 85% of it will be gone. It has a high binding coefficient and with protein 90% is bound to the plasma." When these types of facts are known, the physician is more likely to listen.

The type of information mentioned in this section is available in many books. Some are listed in the reference section. Most medication package inserts available today provide information on the half-life, plasma protein binding, distribution kinetics, and excretion rates. Use them, because, in two out of three drugs, there will be no information about their indication or their use during breastfeeding.

On the following pages are several tables that may be helpful when working with breastfeeding women who are needing to take a medication. In all cases, when the woman has a specific question about a medication, she should be referred to her pharmacist, her doctor, or her baby's doctor. Tables 6 through 9 are taken from: AAP: The transfer of drugs and other chemicals into human milk. *Peds* 93:137-50, January, 1994.

Ways to Minimize Neonatal Exposure	
✓	Withhold the drug.
✓	Delay therapy and wait for a few months if possible.
✓	Choose drugs that penetrate milk early.
✓	Choose drugs that pass poorly into breastmilk .
✓	Avoid nursing at times of peak drug concentrations in breastmilk.
✓	Administer the drug before the infant's longest sleep period.
✓	Temporarily withhold breastfeeding.
✓	Only as a last resort, stop breastfeeding.

Table 3. Ways to Minimize Exposure.

General Guidelines	
➤	Assess the requirements for the drug..
➤	Drugs which have little or no safety data available should not be used.
➤	When possible, choose drugs with shorter half lives.
➤	When a safer drug or drug combination is available, it should be used in place of one which is not considered safe.
➤	Combination drugs should be avoided unless specific symptoms can be treated with a drug combination that has an established safety record.
➤	“Extra strength” and long-acting forms of drugs should be avoided, when possible.
➤	The mother should be informed about possible side effects that she must monitor in her infant as well as herself.

Table 4. General Guidelines to Consider.




Recommendations for the Health Professional	
	Learn more about drugs and breastfeeding,
	Use good reference books, such as <i>Drugs in Pregnancy & Lactation</i> by Briggs or <i>Medications and Mother's Milk</i> by T. Hale.
	There are a lot of misconceptions about breastfeeding. Education is critical.

Table 5. Recommendations for Health Professionals Working with Breastfeeding Mothers.

Drug	Intended Use	Reason for Concern
Amphetamine*	Drug of abuse	Irritability in infant, poor sleeping pattern, concentrate in breastmilk
Bromocriptine	Parkinson's disease	Suppresses lactation; may be hazardous to mother
Cocaine*	Drug of abuse	Cocaine intoxication
Cyclophosphamide	Cancer	Possible immune suppression; unknown effect on growth or association with carcinogenesis (cancer causing); neutropenia (decreased number of neutrophils in blood)
Cyclosporine	Arthritis	Possible immune suppression; unknown effect on growth or association with carcinogenesis
Doxorubicin	Cancer	Possible immune suppression; unknown effect on growth or association with carcinogenesis; concentrates in breastmilk
Ergotamine	Migraines	Vomiting, diarrhea, convulsions
Heroin*	Drug of abuse	Tremors, restlessness, vomiting, poor feeding
Lithium	Mental disorders	One-third to one-half therapeutic blood concentration in infants
Marijuana*	Drug of abuse	Only one report in literature
Methotrexate	Cancer	Possible immune suppression; unknown effect on growth or association with carcinogenesis; neutropenia
Nicotine*	Drug of abuse	Shock, vomiting, diarrhea, rapid heart rate, restlessness; decreased milk production
Phencyclidine (PCP)*	Drug of abuse	Potent hallucinogen

Table 6. Drugs Contraindicated During Breastfeeding.

*The Committee on Drugs of the American Academy of Pediatrics strongly believes that breastfeeding mothers should not ingest any of these compounds. Not only are they hazardous to the breastfeeding infant, but they are also detrimental to the physical and emotional health of the mother. This is only a partial listing; no drug of abuse should be ingested by breastfeeding mothers even though adverse reports are not in the literature.

Drug	Recommended Time for Cessation of Breastfeeding
Copper 64	Radioactivity in milk present at 50 hours
Gallium 67	Radioactivity in milk present for 2 weeks
Indium 111	Radioactivity in milk present at 20 hours
Iodine 123	Radioactivity in milk present up to 36 hours
Iodine 125	Radioactivity in milk present for 12 days
Iodine 131	Radioactivity in milk present 2-14 days, depending on study
Radioactive sodium	Radioactivity in milk present at 96 hours
Technetium-99m	Radioactivity in milk present at 15 hours to 3 days

Table 7. Drugs Requiring Temporary Cessation of Breastfeeding.

Drug	Reported Effect
5-Aminosalicylic acid ➤ antitubercular	Diarrhea (1 case)
Aspirin (salicylates)	Metabolic acidosis (1 case)
Clemastine ➤ antihistamine	Drowsiness, irritability, refusal to feed, high-pitched cry, neck stiffness (1 case)
Phenobarbital ➤ sedative, anticonvulsant	Sedation; infantile spasms after weaning from milk containing phenobarbital, methemoglobinemia (1 case)
Primidone ➤ anticonvulsant	Sedation; feeding problems
Sulfasalazine ➤ anti-inflammatory for ulcerative colitis	Bloody diarrhea (1 case)

Table 8. Drugs Associated With Significant Effects on Some Breastfeeding Infants Which Should Be Given to Breastfeeding Mothers With Caution.

Psychotropic drugs, the compounds listed under antianxiety, antidepressant, and antipsychotic categories, are of special concern when given to breastfeeding mothers for long periods. Although there are no case reports of adverse effects in breastfeeding infants, these drugs do appear in human milk and thus could conceivably alter short-term and long-term central nervous system function.

Drug	Reported Effect
Antianxiety	
Diazepam	None
Lorazepam	None
Midazolam	...
Perphenazine	None
Prazepam	None; concentrates in human milk
Quazepam	None
Temazepam	...
Antidepressants	
Amitriptyline	None
Amoxapine	None
Desipramine	None
Dothiepin	None
Doxepin	None
Fluoxetine	...
Fluvoxamine	...
Imipramine	None
Trazodone	None

Table 9. Drugs Whose Effects May Be of Concern.

Drug	Reported Effect
Antipsychotic	
Chlorpromazine	Drowsiness and lethargy in infant
Chlorprothixene	None
Haloperidol	None
Mesoridazine	None
Chloramphenicol	Possible bone marrow suppression
Metoclopramide	None described; concentrates in breastmilk
Metronidazole	May discontinue breastfeeding for 12-24 hours to allow excretion of dose when single-dose therapy given to mother
Tinidazole	May discontinue breastfeeding for 12-24 hours to allow excretion of dose when single-dose therapy given to mother

Table 9. Drugs Whose Effects May Be of Concern (cont.).

OVER-THE COUNTER PRODUCTS

COUGH, COLD, AND ALLERGY PREPARATIONS*

Actidil (tripolidine) - Y*

Actifed (tripolidine / pseudoephedrine) - Y*, Y**

Actifed Plus (acetaminophen / pseudoephedrine / tripolidine) - N

Actifed 12-Hour (pseudoephedrine / tripolidine) - N

Afrinol (pseudoephedrine - long-acting) - N

Alka-Seltzer Plus (phenylpropanolamine / diphenhydramine / aspirin) - N

Alleract (tripolidine) - Y*

Alleract Decongestant (pseudoephedrine / tripolidine) - Y*, Y**

Allerest (acetaminophen / chlorpheniramine / phenylpropanolamine) - N

Allerest No Drowsiness (acetaminophen / pseudoephedrine) - N

A.R.M. (chlorpheniramine / phenylpropanolamine) - Y*, Y**

BC Cold Powder Multi-Symptom Formula (aspirin / phenylpropanolamine / chlorpheniramine) - N

BC Cold Powder Multi-Symptom Non-Drowsy Formula (aspirin / phenylpropanolamine) - N

Benadryl Decongestant (diphenhydramine / pseudoephedrine) - Y*, Y**

Benadryl Elixir (diphenhydramine) - Y*

Benadryl 25 (diphenhydramine) - Y*

Benadryl Plus (diphenhydramine / pseudoephedrine / acetaminophen) - N

Benylin Cough Syrup (diphenhydramine) - Y*

Benylin-DM (dextromethorphan) - Y*

Benylin Decongestant (diphenhydramine / pseudoephedrine) - Y*, Y**

Benylin Expectorant (dextromethorphan / guaifenesin) - Y*

Bromfed (brompheniramine / pseudoephedrine) - Y*, Y**

Cerose-DM (dextromethorphan / chlorpheniramine / phenylephrine) - N

Cheracol-D(dextromethorphan / guaifenesin) - Y*

Cheracol-D Plus (phenylpropanolamine / dextromethorphan / chlorpheniramine) - N

Chlor-Trimeton (chlorpheniramine) - Y*

Chlor-Trimeton (chlorpheniramine - long-acting) - N

Chlor-Trimeton Decongestant (chlorpheniramine / pseudoephedrine) - Y*, Y**

Chlor-Trimeton Decongestant (chlorpheniramine / pseudoephedrine - long-acting) - N

CO ADVIL (ibuprofen / pseudoephedrine) - N

Comtrex Allerov-Sinus (acetaminophen / pseudoephedrine / chlorpheniramine) - N

Comtrex Cough Formula (acetaminophen / pseudoephedrine / guaifenesin / dextromethorphan) - N

Comtrex Liquid (acetaminophen / pseudoephedrine / chlorpheniramine / dextromethorphan / alcohol (liquid), 20%) - N

Comtrex Liqui-Gel (acetaminophen / phenylpropanolamine / chlorpheniramine / dextromethorphan) - N

Congestac (pseudoephedrine / guaifenesin) - Y**

Contac (phenylpropanolamine / chlorpheniramine-long-acting) - N

Contac Cough Formula (dextromethorphan / guaifenesin) - N

COUGH, COLD, AND ALLERGY PREPARATIONS

Contac Cough & Sore Throat Formula (acetaminophen / dextromethorphan / guaifenesin) - N

Contac Maximum Strength (phenylpropanolamine / chlorpheniramine - long-acting) - N

Contac Maximum Strength Sinus (pseudoephedrine / acetaminophen) - N

Contac Nighttime Cold Medicine (acetaminophen / dextromethorphan / pseudoephedrine / doxylamine / alcohol, 25%) - N

Contac Severe Cold Formula (acetaminophen / dextromethorphan / phenylpropanolamine / chlorpheniramine) - N

Coricidin (chlorpheniramine / acetaminophen) - Y*

Coricidin-D Decongestant (chlorpheniramine / phenylpropanolamine / acetaminophen) - N

Coricidin Maximum Strength Sinus Headache (acetaminophen / chlorpheniramine / phenylpropanolamine) - N

Demazin (phenylpropanolamine / chlorpheniramine) - Y*, Y**

Demazin Time Release (phenylpropanolamine / chlorpheniramine - long-acting) - N

Dimetane (brompheniramine) - Y*

Dimetane Decongestant (phenylephrine / brompheniramine) - Y*, Y**

Dimetapp (brompheniramine / phenylpropanolamine) - Y*, Y**

Dimetapp Extentabs (brompheniramine / phenylpropanolamine - long-acting) - N

Dimetapp Plus (acetaminophen / phenylephrine / brompheniramine) - N

Disophorol (pseudoephedrine / dexbrompheniramine - long-acting) - N

Dristan (phenylephrine / chlorpheniramine / acetaminophen) - N

Dristan Maximum Strength (pseudoephedrine / acetaminophen) - N

Drixoral (brompheniramine / pseudoephedrine) - Y*, Y**

Drixoral Plus (acetaminophen / dexbrompheniramine / pseudoephedrine) - N

Drixoral Sustained Action (brompheniramine / pseudoephedrine - long-acting) - N

4-Way Cold Tablets (acetaminophen / phenylpropanolamine / chlorpheniramine) - N

Excedrin Sinus (acetaminophen / pseudoephedrine) - N

Fedahist (pseudoephedrine / chlorpheniramine) - Y*, Y**

Fedahist Expectorant (pseudoephedrine / guaifenesin) - Y**

Isocior (chlorpheniramine / pseudoephedrine - long-acting) - N

Naldecon DX Adult Liquid (phenylpropanolamine / guaifenesin / dextromethorphan) - N

Novahistine (chlorpheniramine / phenylephrine) - Y*, Y**

Novahistine - DMX (dextromethorphan / guaifenesin / pseudoephedrine) - N

Ornex (pseudoephedrine / acetaminophen) - Y**

Oscilloccinum (herb extracts) - N

Pyrroxate (chlorpheniramine / phenylpropanolamine / acetaminophen) - N

Robitussin (guaifenesin) - Y

Robitussin-CF (guaifenesin / phenylpropanolamine / dextromethorphan) - N

Robitussin-DM (guaifenesin / dextromethorphan) - Y*

Robitussin Night Relief (acetaminophen / phenylephrine / pyrilamine dextromethorphan) - N

Robitussin-PE (guaifenesin / pseudoephedrine) - Y**

COUGH, COLD, AND ALLERGY PREPARATIONS

Ryna (chlorpheniramine / pseudoephedrine) - Y*, Y**
Scot-Tussin Cough & Cold (dextromethorphan) - N
Scot-Tussin Expectorant (guaifenesin) - Y
Sinarest (acetaminophen / chlorpheniramine / phenylpropanolamine) - N
Sine-Aid Maximum Strength (acetaminophen / pseudoephedrine) - N
Sine-Off Aspirin Formula (chlorpheniramine / phenylpropanolamine / aspirin) - N
Sine-Off Maximum Strength (chlorpheniramine / pseudoephedrine / acetaminophen) - N
Sine-Off Maximum Strength No Drowsiness Formula (acetaminophen / pseudoephedrine) - N
Sinustat (pseudoephedrine / herb extracts) - N
Sinutab (acetaminophen / pseudoephedrine) - N
Sinutab Maximum Strength (acetaminophen / chlorpheniramine / pseudoephedrine) - N
Sinutab Maximum Strength Without Drowsiness (acetaminophen / pseudoephedrine) - N
Sudafed (pseudoephedrine) - Y**
Sudafed Cough (pseudoephedrine / dextromethorphan / guaifenesin) - N
Sudafed Plus (pseudoephedrine / chlorpheniramine) - Y*, Y*
Sudafed Sinus (acetaminophen / pseudoephedrine) - N
Teldrin (chlorpheniramine - long-acting) - N
Theraflu Flu (acetaminophen / pseudoephedrine / chlorpheniramine) - N
Theraflu Flu Cold Medicine (acetaminophen / pseudoephedrine / chlorpheniramine) - N
Theraflu Flu, Cold, & Cough Medicine (acetaminophen / pseudoephedrine / chlorpheniramine / dextromethorphan) - N
Triaminic (phenylpropanolamine / chlorpheniramine) - Y*, Y**
Triaminic-DM (phenylpropanolamine / dextromethorphan) - N
Triaminic Expectorant (phenylpropanolamine / guaifenesin) - Y**
Triaminic-12 (phenylpropanolamine / chlorpheniramine) - N
Triaminicin (phenylpropanolamine / chlorpheniramine / acetaminophen) - N
Triaminicol Multi-Symptom (phenylpropanolamine / chlorpheniramine / dextromethorphan) - N
Tylenol Cold Medication (acetaminophen / chlorpheniramine / pseudoephedrine / dextromethorphan) - N
Tylenol Cold Medication No Drowsiness (acetaminophen / pseudoephedrine / dextromethorphan) - N
Tylenol Maximum-Strength Allergy Sinus (acetaminophen / pseudoephedrine / chlorpheniramine) - N
Tylenol Maximum-Strength Sinus (acetaminophen / pseudoephedrine) - N
Ursinus (pseudoephedrine / aspirin) - N
Vicks Daycare (acetaminophen / dextromethorphan / pseudoephedrine / guaifenesin) - N
Vicks Formula 44 Cough Medicine (dextromethorphan / chlorpheniramine) - N
Vicks Formula 44D Decongestant Cough Medicine (dextromethorphan / pseudoephedrine / guaifenesin) - N

COUGH, COLD, AND ALLERGY PREPARATIONS

Vicks Formula 44M Multi - System Cough Mixture (dextromethorphan / pseudoephedrine / guaifenesin / acetaminophen) - N

Vicks Nyquil (acetaminophen / doxylamine / pseudoephedrine / dextromethorphan / alcohol, 25%) - N

N - Avoid if at all possible when breastfeeding

Y* - Usually safe to take when breastfeeding / monitor for possible drowsiness in infant

Y** - Usually safe to take when breastfeeding / monitor for possible decreased milk production / mother should drink extra fluids.

COUGH AND COLD LOZENGES

Cepacol Lozenges (cetylpyridium) - Y

Cepacol Anesthetic Lozenges (cetylpyridium / benzocaine) - Y

Cepastat Lozenges (phenol / menthol) - N

Chloraseptic Lozenges (phenol / menthol or benzocaine / menthol) - N

Halls Mentho-Lyptus (eucalyptus oil / menthol) - Y

HOLD Lozenges (dextromethorphan) - Y*

Listerine Antiseptic Throat Lozenges (hexylresorcinol) - N

N'ICE Lozenges (menthol) - Y

Sucrets Lozenges (hexylresorcinol) - N

Sucrets Cold Relief Lozenges (hexylresorcinol / menthol) - N

Sucrets Cough Control Lozenges (dextromethorphan) - Y*

Sucrets Maximum Strength Lozenges (dyclonine) - Y

Throat Discs (Glycyrrhiza) - N

Vicks Cough Silencers (dextromethorphan / benzocaine) - Y*

Vicks Formula 44 Cough Control Discs (dextromethorphan / benzocaine) - Y*

Vicks Throat Lozenges (benzocaine / cetylpyridium / menthol / camphor eucalyptus oil) - Y

Y* - Monitor for possible drowsiness in infant

ASTHMA PREPARATIONS

Asthmahaler (epinephrine) - get doctor's recommendation

Asthmanephrin (racepinephrine) - get doctor's recommendation

Bronkaid Mist (epinephrine) - get doctor's recommendation

Bronkaid Tablets (epinephrine / guaifenesin / theophylline) - get doctor's recommendation

Bronkoelixir (ephedrine / guaifenesin / theophylline / phenobarbital) - get doctor's recommendation

Bronkotabs (ephedrine / guaifenesin / theophylline / phenobarbital) - get doctor's recommendation

Primatene Mist (epinephrine) - get doctor's recommendation

ASTHMA PREPARATIONS

Primatene M Formula (theophylline / ephedrine / pyrilamine) - N

Primatene P Formula (theophylline / ephedrine / phenobarbital) - get doctor's recommendation

Primatene Regular Formula (theophylline / ephedrine) - get doctor's recommendation

COUGH SUPPRESSANTS

Dextromethorphan

EXPECTORANTS

Guaifenesin

NASAL PREPARATIONS

Afrin Nasal Spray and Drops (oxymetazoline) - N

Benzedrex Inhaler (propylhexedrine) - N

Coricidin Nasal Mist (oxymetazoline) - N

Dristan Nasal Spray (phenylephrine / pheniramine) - N

Dristan Long Lasting Nasal Spray (oxymetazoline) - N

Duration 12 Hour Nasal Spray (oxymetazoline) - N

4-Way Fast Acting Nasal Spray (phenylephrine / naphazoline pyrilamine) - N

4-Way Long Acting Nasal Spray (oxymetazoline) - N

NaSal Spray and Drops (sodium chloride) - Y

Neo-Synephrine Spray and Drops (phenylephrine) - Y**

Neo-Synephrine 12 Hour Spray & Drops (oxymetazoline) - N

Nostril LA Long Acting Nasal Decongestant (oxymetazoline) - N

NTZ Spray and Drops (oxymetazoline) - N

Otrivin Nasal Spray and Drops (xylometazoline) - N

Privine Nasal Spray and Solution (naphazoline) - N

St. Joseph Measured Dose Nasal Decongestant (phenylephrine) - Y**

Vicks Inhaler (desoxyephedrine / menthol / camphor) - N

Vicks Sinex Nasal Spray-(phenylephrine / menthol / camphor / eucalyptus oil) - N

Vicks Sinex Long Acting Nasal Spray - (oxymetazoline) - N

Vicks Vatronol Nose Drops (ephedrine / menthol / camphor / eucalyptol) - N

Nostril LA Long Acting Nasal Decongestant (oxymetazoline) - N

Y** - Monitor for possible decreased milk production. Drink extra fluids.

ANALGESICS

Acetaminophen

Aspirin

Ibuprofen

MISCELLANEOUS

Alcohol
Benzocaine (local anesthetic)
Camphor (soothing agent)
Cetylpyridium (antiseptic)
Dyclonine (local anesthetic)
Eucalyptol (soothing agent)
Eucalyptus Oil (soothing agent)
Glycyrrhiza (soothing agent)
Herb Extracts (defense system stimulant)
Hexylresorcinol (antiseptic)
Menthol (soothing agent)
Phenol (local anesthetic)

ANTIHISTAMINES

Brompheniramine
Chlorpheniramine
Dexbrompheniramine
Diphenhydramine
Doxylamine
Pheniramine
Pyrilamine
Tripolidine

DECONGESTANTS

Desoxyephedrine
Ephedrine
Naphazoline
Oxymetazoline
Phenylephrine
Phenylpropanolamine
Propylhexedrine
Pseudoephedrine

ANTI-DIARRHEAL PREPARATIONS

Diasorb (attapulgate) - Y
Donnagel (kaolin / pectin / belladonna alkaloids) - N
Kaopectate (attapulgate) - Y
Pepto-Bismol (bismuth subsalicylate) - Y
Rheaban (attapulgate) - Y

STIMULANTS

No Doz (caffeine, 100mg) - Y

Vivarin (caffeine, 200mg) - N*

N* - Less than 150mg two to three times a day has no apparent affect on breastfeeding infant. Probably better to drink cup of coffee than to take drug

ANALGESICS

Acetaminophen, 325mg. - Y

Acetaminophen, 500mg. - N

Advil (ibuprofen) - Y

Alka Seltzer Extra Strength (aspirin / sodium bicarbonate) - N

Anacin (aspirin / caffeine) - N

Anacin Maximum Strength (aspirin / caffeine) - N

Anacin-3 Regular Strength (acetaminophen) - Y

Anacin-3 Maximum Strength (acetaminophen) - N

Arthritis Pain Formula (aspirin / antacid) - N

Ascriptin (aspirin / antacid) - N

Ascriptin - A / D (aspirin / antacid) - N

Ascriptin Extra Strength (aspirin / antacid) - N

Aspirin, 325 mg. - N

Aspirin, 500mg. - N

Bayer Aspirin (aspirin) - N

Bayer Aspirin Maximum (aspirin) - N

Bayer 8-Hour (aspirin) - N

BC Powder (aspirin / salicylamide / caffeine) - N

BC Powder Arthritis Strength (aspirin / salicylamide / caffeine) - N

Bufferin Arthritis Strength (aspirin) - N

Bufferin (aspirin) - N

Bufferin Extra -Strength (aspirin) - N

Datril Extra Strength (acetaminophen) - N

Doan's Extra Strength (magnesium salicylate) - N

Doan's Regular Strength (magnesium salicylate) - N

CAMA Arthritis Pain Reliever (aspirin / antacid) - N

Ecotrin (aspirin) - N

Empirin Aspirin (aspirin) - N

Excedrin Extra Strength (acetaminophen / aspirin / caffeine) - N

Haltran (ibuprofen) - Y

Ibuprohm (ibuprofen) - Y

Medipren (ibuprofen) - Y

Midol (aspirin / pyrilamine) - N

Midol Maximum Strength (acetaminophen / pyrilamine) - N

Midol PMS (acetaminophen / pamabrom / pyrilamine) - N

ANALGESICS

Midol 200 Advanced Cramp (ibuprofen) - Y
Mobigesic Analgesic (magnesium salicylate / phenyltoloxamine) - N
Momentum (aspirin / phenyltoloxamine) - N
Motrin IB (ibuprofen) - Y
Nuprin (ibuprofen) - Y
Panadol Maximum Strength (acetaminophen) - N
Percogesic (acetaminophen / phenyltoloxamine) - N
Premsyn PMS (acetaminophen / pamabrom / pyrilamine) - N
Q-Vel (quinine / vitamin E) - N
St. Joseph Adult Chewable Aspirin (aspirin) - N
Sominex Pain Relief (diphenhydramine / acetaminophen) - N
Tempra (acetaminophen) - Y
Trendar (ibuprofen) - Y
Tylenol Extra - Strength (acetaminophen) - N
Tylenol Regular Strength and Elixir (acetaminophen) - Y
Unisom Dual Relief (acetaminophen / diphenhydramine) - N
Vanquish (aspirin / acetaminophen / caffeine / antacid) - N

N - Avoid if at all possible when breastfeeding

Y - Usually safe to take when breastfeeding

ANTACIDS / DIGESTIVE AIDS

Alka-Mints (calcium carbonate) - Y
Alka-Seltzer (aspirin / sodium and / or potassium bicarbonate) - N
Alka-Seltzer Advanced Formula (acetaminophen / calcium carbonate sodium - potassium bicarbonate) - N
Aludrox (aluminum - magnesium hydroxide) - Y
ALternaG (aluminum hydroxide) - Y
Amphojel (aluminum hydroxide) - Y
Basaljel (aluminum carbonate) - Y
Camalox (magnesium - aluminum hydroxide / calcium carbonate) - Y
Citrocarbonate (sodium bicarbonate-citronate) - N
DDS-Acidophilus (lactobacillus acidophilus) - Y
DiGel (simethicone / magnesium or aluminum hydroxide) - Y
Eno (sodium tartrate - citrate) - N
Festal 11 (digestive enzymes) - Y
Gas-X (simethicone) - Y
Gas-X Extra Strength (simethicone) - Y
Gaviscon (aluminum hydroxide / magnesium trisilicate) - Y
Gaviscon Extra Strength (aluminum hydroxide / magnesium carbonate) - Y
Gelusil (aluminum hydroxide / magnesium hydroxide / simethicone) - Y
Gelusil-II (aluminum hydroxide / magnesium hydroxide / simethicone) - Y
Lactaid (lactase enzyme) - Y
Lactinex (lactobacillus culture) - Y

ANTACIDS / DIGESTIVE AIDS

Lactrase (lactase) - Y
Maalox (magnesium - aluminum hydroxide) - Y
Maalox Extra Strength (magnesium-aluminum hydroxide / simethicone) - Y
Marblen (magnesiumcarbonate / calciumcarbonate) - Y
Mylanta (aluminum-magnesium hydroxide / simethicone) - Y
Mylanta - 11 (aluminum - magnesium hydroxide / simethicone) - Y
Mylicon (simethicone) - Y
Mylicon-80 (simethicone) - Y
Mylicon-125 (simethicone) - Y
Nephrox (aluminum hydroxide) - Y
Pepto-Bismol (bismuthsubsalicylate) - Y
Phazyme (simethicone) - Y
Riopan (magaldrate) - Y
Riopan Plus (magaldrate / simethicone) - Y
Riopan Plus 2 (magaldrate / simethicone) - Y
Roloids (dihydroxyaluminum sodium carbonate) - Y
Roloids Extra Strength (calcium carbonate) - Y
Roloids Sodium Free (calcium carbonate / magnesium hydroxide) - Y
Tums (calciumcarbonate) - Y
Tums E-X (calcium carbonate) - Y
Tums Extra Strength (calciumcarbonate / simethicone) - Y
Wingel (aluminum - magnesium hydroxide) - Y

LAXATIVES

Agora[(mineral oil) - N
Carters Little Pills (bisacodyl) - N
Citrucel (methylcellulose) - Y
Colace (docusate) - Y
Correctol (phenolphthalein / docusate) - N
Dialose (docusate) - Y
Dialose Plus (docusate / casanthranol) - N
Doxidan (phenolphthalein / docusate) - N
Dulcolax Tablets & Suppositories (bisacodyl) - N
Effer-Syllium (psyllium) - Y
Evac-U-Gen (phenolphthalein) - N
Ex-Lax (phenolphthalein) - N
Ex-Lax (phenolphthalein / docusate) - N
Feen-A-Mint (phenolphthalein) - N
Fleet Enema (sodium biphosphate - phosphate), Regular - Y
Fiberall (psyllium) - Y
Gentle Nature (sennosides) - N
Glycerin Suppositories - Y
Haley's M-0 (magnesium hydroxide / mineral oil) - N
Kasof High Strength (docusate) - N
Maltsupex (barley malt extract) - Y

LAXATIVES

Metamucil (psyllium) - Y
Modane (phenolphthalein) - N
Modane Plus (phenolphthalein / docusate) - N
Nature's Remedy (cascara sagrada) - N
Neoloid (castor oil) - N
Perdiem (psyllium / senna) - N
Perdiem Plain (psyllium) - Y
Peri-Colace (casanthranol / docusate) - N
Phillips' Laxcaps (phenolphthalein / docusate) - N
Phillips' MOM (magnesium hydroxide) - Y
Purge (castor oil) - N
Regutol (docusate) - Y
Senokot (senna) - N
Serutan (psyllium) - Y
Surfak (docusate) - Y
Swan Citroma (magnesium citrate) - N
Syllact (psyllium) - Y
Unilax (docusate / phenolphthalein) - N
Yellolax (phenolphthalein / byronia / hydrastis) - N

NAUSEA & VOMITING / MOTION SICKNESS PREPARATIONS

Benadryl Elixir (diphenhydramine) - Y*
Benadryl 25 (diphenhydramine) - Y*
Bonine (meclizine) - N
Dramamine (dimenhydrinate) - Y*
Emetrol (phosphorated carbohydrates) - Y
Marezine (cyclizine) - N

Y* -Monitor infant for drowsiness

ARTIFICIAL SWEETENERS

Equal / NutraSweet (aspartame) - Y

WEIGHT CONTROL PREPARATIONS

Acutrim (phenylpropanolamine, 75 mg - long-acting) - N
Dexatrim (phenylpropanolamine, 25 mg - immediate release) - N
Dexatrim (phenylpropanolamine, 50-75 mg - long-acting) - N

SLEEP PREPARATIONS

Benadryl Elixir (diphenhydramine) - Y*
Benadryl 25 (diphenhydramine) - Y*
Miles Nervine Nighttime Sleep-Aid (diphenhydramine) - Y*
Nytol (diphenhydramine) - Y*

SLEEP PREPARATIONS

Sleep-Eze 3 (diphenhydramine) - Y*
Sleepinal (diphenhydramine) - Y*
Sominex (diphenhydramine) - Y*
Unisom Nighttime Sleep Aid (doxylamine) - N

Y* -Monitor infant for drowsiness

HEMORRHOIDAL PREPARATIONS

Americaine (benzocaine) - Y
Anusol (bismuth / zinc oxide / peruvian balsam / pramoxine) - Y
Nupercainal (dibucaine) - Y
Pazo (benzocaine / ephedrine / zinc oxide / camphor) - Y
Preparation H (yeast cell derivative / shark liver oil) - Y
Tronolane (pramoxine) - Y
Wyanoids (yeast cell derivative / shark liver oil) - Y

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Study Questions - Chapter 12

1. What factors play a role in determining the quantity of a drug that reaches the infant?
2. What are the factors that influence drug transfer?
3. What is the time-to-peak interval?
4. What questions should be considered about a drug's absorption?
5. Are antibiotics safe to take for breastfeeding women?
6. Are analgesics safe to take for breastfeeding women?
7. Are antihistamines and decongestants safe to take for breastfeeding women?
8. Is it OK for the breastfeeding woman to drink herbal teas?

9. Can a breastfeeding woman drink an alcohol-containing beverage?